General Permit for
Discharges from Utility Vaults and
Underground Structures to Surface Waters
Order No. 2006-0008-DWQ
NPDES No. CAG990002

Pollution Prevention Plan

ENCANA™

United States Gas Storage Unit

Wild Goose Storage Inc.
Wild Goose Gas Storage Project
2780 West Liberty Road
Gridley, CA 95948

October 2006

Wild Goose Gas Storage Project Pollution Prevention Plan

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October 2006

A. Introduction

Utility companies may have short-term intermittent discharges from utility vaults and other underground and above-ground structures as a result of subterranean seepage and/or storm water inflow. These structures may have small quantities of oil and grease present due to the normal operation of equipment, as well as small quantities of other pollutants. Typically these discharges do not cause, have the reasonable potential to cause, or contribute to an in-stream excursion above any applicable State or federal water quality objectives/criteria or cause acute or chronic toxicity in the receiving water. The State Water Resources Control Board (SWRCB) has elected to issue a statewide general NPDES permit that may be applied to most discharges from utility companies to surface waters. In July 2006 the State Water Resources Control Board approved a new statewide National Pollutant Discharge Elimination System (NPDES) General Permit CAG990002, Order 2006-0008-DWQ, for discharges by utility companies to surface waters.

Wild Goose Storage Inc. (WGSI), a division of EnCana Corporation's United States Gas Storage Unit, became a public natural gas utility upon certification of its natural gas storage project by the California Public Utilities Commission on June 25, 1997. WGSI is unique in that it does not have a defined 'service area', but can offer its natural gas storage services to any customer based on that customer's particular natural gas needs via its pipeline connection to PG&E's natural gas transmission pipeline system. On February 10, 2000, Wild Goose Storage Inc. filed its Notice of Intent and was subsequently issued Waste Discharge Identification (WDID) Number 9000U000059 under the previous General Permit.

B. General Description of the Project

The construction of the initial Wild Goose Gas Storage Project in Butte County, California between April 1997 and April 1999 involved the development of a depleted and abandoned underground natural gas field for use in gas storage. An expansion of the facility was completed in April 2004 that included an enlarged Well Pad Site and a new pipeline to connect the facility to PG&E's backbone natural gas transmission system. The entire project area is located in Butte and Colusa Counties, within the jurisdiction of the Redding Office of the Central Valley Regional Water Quality Control Board. However, discharges covered by this permit only occur at the Well Pad Site and Remote Facility Site in Butte County. As depicted on the map in Appendix A, the existing project components are:

Well Pad Site

The 2.9-acre Well Pad Site was created at the location of the abandoned original Wild Goose Gas Field production compression facility on the Wild Goose Club. The Club consists of over 1400 acres of wetland and riparian lands which are managed as habitat for waterfowl and other wetland/marsh species. As part of the Butte Sink, the entire area is subject to winter flooding when high flows from the Butte Creek watershed encounter Sacramento River flood flows in the Colusa Bypass via Moulton Weir, backing the water up into the Butte Sink. At the Well Pad Site, flood levels have been measured at depths of up to four feet, and the site may be at least partially inundated for up to several weeks. The Well Pad Site is surrounded by a 3- to 4-foot high landscaped berm, and contains 8 injection/withdrawal wells and 3 gas field monitoring

wells, associated piping, a pipeline pig launcher/receiver, and a small building which houses the monitoring and control equipment. The well head valves are in subsurface concrete vaults approximately 10 feet by 15 feet by 8 feet deep, and are normally covered by steel plates. All equipment and facilities are designed to withstand this periodic inundation, except the control building which is elevated above the flood water level. Air pressure provided by a compressor in the control building is used to operate the valves. The site is covered with compacted aggregate road base providing a virtually impervious surface. Storm water in the subsurface vaults at this site results from surface runoff and the flood waters which may inundate the site.

Remote Facility Site

A 6.1-acre Remote Facility Site for metering, processing, and compressing the natural gas is located on West Liberty Road approximately 4.5 miles east and north of the Well Pad Site. The site contains an office, produced water storage tanks with secondary containment, the compressor buildings, arrays of cooling fans, glycol regeneration units with secondary containment, various vessels and piping runs, a compressed air and materials storage building, and a methanol storage tank with secondary containment. The Remote Facility Site is outside the 100-year flood plain and surrounded on three sides by rice fields. Across the county road from the facility is the California Department of Fish and Game's Gray Lodge Wildlife Management Area which provides extensive riparian and wetland acreage. The site is covered with loose aggregate providing a semi-permeable surface.

Natural Gas Pipelines

A 4.5-mile, 18-inch-diameter bi-directional natural gas pipeline connects the Well Pad Site with the Remote Facility Site. A 25-mile, 30-inch pipeline connects the Remote Facility Site with PG&E's 36-inch and 42-inch backbone transmission pipeline system west of Interstate 5, near Delevan in Colusa County. There is also a connection to PG&E's 16-inch local gas transmission pipeline in the northeast corner of the Remote Facility Site. Two ancillary facilities associated with this pipeline include a mainline block valve lot just west of the Sacramento River and the metering and valve site at the PG&E interconnect adjacent to the Delevan Compressor Station. There are no storm water discharges associated with the pipelines or the ancillary facilities.

C. Provisions for Discharges

Only Scheduled Discharges occur on this project – there are no Unscheduled, Reservoir or Emergency Discharges. Scheduled Discharges are required from the gas well valve vaults at the Well Pad Site, and from the open secondary containment structures surrounding the produced water storage tanks, the produced water injection well skid, the urea tank, the building drain tank, the glycol storage tank, and the methanol storage tank at the Remote Facility Site.

D. Pollution Prevention Team

Project staffing consists of the Superintendent, a Production Coordinator, a Maintenance Mechanic, two Instrument/Electrical Technicians and three Operators. All staff are located at the Remote Facility Site. The Superintendent is responsible for developing the Plan. Under the direction of the Superintendent, implementation of the Plan, conducting maintenance, performing and monitoring the discharges, and recommending revisions to the Plan is primarily

the responsibility of the three operators. However, with such a small staff, all members are considered part of the Pollution Prevention Team performing any of these tasks on an as-needed basis.

E. Description of Potential Pollutant Sources

E.1. Drainage Maps

Maps illustrating the location of the permitted facilities and discharge locations are included in Appendix A. Discharges at the Remote Facility Site drain south across the gravel surface to the drainage ditch on the edge of the county road [West Liberty Road]. This drainage flows west approximately one mile into the Reclamation District 833 Main Drain canal, then into the Cherokee Canal, finally into Butte Creek approximately seven miles southwest of the site. Drainage at the Well Pad Site is toward the center of the southern berm where a gate valve controls releases into a waterway in the adjacent managed wetlands of the Wild Goose Club. This waterway meanders through the Club and eventually flows into Butte Creek toward the south end of the Club, approximately one mile from the discharge point.

E.2. Inventory of Exposed Materials

Potential pollutants which may mix with storm water either in the subsurface vaults at the Well Pad Site or in open secondary containment at the Remote Facility Site are hydraulic oil, oil and grease lubricants, urea, glycol and methanol. Except for urea which was added in 2004 as part of a project expansion, these materials have been present at the Project since initial operations began in 1999. In all cases, volumes subject to contact with storm water are limited only to residual surface films found on the valves, piping, flanges or other similar fitting, or small puddles where these pollutants might have dripped from the fittings. The facility, equipment and pollutants subject to storm water contact and discharges are listed below.

Facility/Equipment	*Pollutant*
Gas well valve vaults – valves & valve actuators	Hydraulic & lubricating oil
Glycol tank and containment – tank valves & fittings, product	Lubricating oil & grease, tri-ethylene glycol
Produced water tanks & containment and injection well skid containment – tank valves & fittings, stored product	Lubricating oil & grease, produced water
Methanol tank & containment – tank valves & fittings, stored product	Lubricating oil & grease, methanol
Building drain tank & containment – tank valves & fittings, stored product	Lubricating oil & grease, oily washdown water
Urea tank – valves & fittings, stored product	Lubricating oil & grease, urea

Produced water is saline water entrained in the natural gas as it is extracted from the underground natural gas formation during withdrawal operations and is removed from the natural gas via several processes to meet gas quality standards. It's salinity is approximately equal to sea water, so it is temporarily stored in the produced water tanks until it is re-injected into the underground sandstone formation via the injection well at the Remote Facility Site. If the

volumes of produced water exceed the injection capacity of the well (e.g. during periods of heavy gas withdrawal), the excess produced water may be transported to a licensed facility near Rio Vista for disposal.

MSDS sheets for hydraulic oil, triethylene glycol, methanol and urea are included in Appendix B. The tri-ethylene glycol is used to remove water vapor from the gas stream. Methanol is injected into the gas stream in the pipeline to prevent ice formation during unusually cold weather. Urea is an ammonia-based reductant which is injected into the compressor engine exhaust to reduce NOx emissions.

Appendix C includes a summary of the Project's discharge sampling results for the last three years (2003 – 2005). This summary will serve as the "Case Study" representing the typical types of discharges from the Project's vaults and containment structures. The produced water injection well skid was installed in 2006 so the sampling results for discharges from this containment structure will be included in the 2006 annual report.

E.3. Spills and Leaks

Since all discharges are scheduled and controlled by the operator, there have been no spills or leaks of toxic or hazardous pollutants from areas exposed to precipitation or otherwise entering the discharge stream since the Project began operations in 1999.

E.4. Risk Indemnification and Summary of Potential Pollutant Sources

Potential pollutant sources at the Project include the following sites:

- ***Gas Well Valve Vaults:*** The eleven subsurface valve vaults located at Well Pad Site are pumped to remove storm water that collects from winter precipitation or after the site is inundated by floodwaters in the Butte Sink. The storm water is pumped onto the well pad surface, flowing to and collecting within the perimeter berm at the center of the south berm where the gate valve regulating site drainage is located. The gate valve is closed while the discharges are occurring and is not opened until the collected vault discharge water is visually inspected by staff for contaminants. The vaults have a capacity of approximately 4,300 gallons each and the pumped discharge takes approximately 2 hours to complete, depending on the depth of the storm water in the vault.
- ***Produced Water Tank Containment:*** The six produced water storage tanks are situated in a basin providing 110 percent external containment. These tanks have a combined total of 100,800 gallons of capacity. The open, concrete-walled containment, with a capacity of approximately 111,000 gallons, does not have a manually operated drain valve to allow gravity flow. Therefore, storm water is pumped onto adjacent land surfaces and discharges are scheduled when collected storm water depth reaches about six inches.
- ***Produced Water Injection Well Skid Containment:*** This containment is provided to collect/retain any produced water that is spilled or otherwise released during the injection process and to provide positive fluid head to the subsurface pumps. The containment is 25' by 26' in size with 3-feet high walls. It does not have a manually operated drain valve to allow gravity flow. Therefore, storm water is pumped onto adjacent land surfaces and discharges are scheduled when collected storm water depth reaches about six inches.

- ***Glycol Regeneration Unit Containment:*** The two glycol regeneration units at the Remote Facility Site contain a total of approximately 11,000 gallons of glycol and are situated in a basin providing 110 percent external containment. The open, concrete-walled containment, with a capacity of approximately 12,100 gallons, does not have a manually operated drain valve to allow gravity flow. Therefore, storm water is pumped onto adjacent land surfaces and discharges are scheduled when collected storm water depth reaches about six inches.
- ***Methanol Tank Containment:*** The 400-gallon storage tank is situated in a basin providing 110 percent external containment. The open, concrete-walled containment, with a capacity of approximately 440 gallons, does not have a manually operated drain valve to allow gravity flow. Therefore, storm water is pumped onto adjacent land surfaces and discharges are scheduled when collected storm water depth reaches about six inches.
- ***Building Drain Tank Containment:*** The 3,200-gallon storage tank is situated in a basin providing 110 percent external containment, or approximately 3600 gallon capacity. The open, concrete-walled containment has a manually operated drain valve to allow collected storm water to gravity flow onto adjacent land surfaces. The valve is normally closed and is manually opened only during a scheduled discharge, typically when collected storm water depth reaches about six inches.
- ***Urea Tank Containment:*** The 8,500-gallon storage tank is situated in a basin providing 110 percent external containment, or approximately 9,400 gallon capacity. The open, concrete-walled containment has a manually operated drain valve to allow collected storm water to gravity flow onto adjacent land surfaces. The valve is normally closed and is manually opened only during a scheduled discharge, typically when collected storm water depth reaches about six inches.

The pollutants normally associated with these discharges are listed in Section E.2. above.

F. Measures and Controls

The following pollution prevention practices are currently being implemented to control and manage storm water discharges at the Project.

F.1. Good Housekeeping

Following well head valve maintenance, all oils and greases are manually cleaned as well as possible from affected valve surfaces with conventional methods such as rags and solvents. Following filling of the glycol, methanol and urea tanks or maintenance of the tank and containment discharge valves and other fittings, all spilled product, oils and greases are manually cleaned as well as possible from affected surfaces with conventional methods such as rags and solvents. The rags are disposed of properly.

F.2. Preventative Maintenance

Preventative maintenance is provided at least annually for all tanks and containment valves/fittings on the various sources described above.

F.3. Spill Prevention and Response Procedures

Spills are possible at any of the storage tanks on the project. However, all of these tanks are inside secondary containment providing 110 percent of the capacity of the tanks. The glycol, produced water, produced water injection skid and methanol containment structures do not have discharge valves, so all discharges are by pumping, thereby precluding a spill where the stored liquids could reach surface waters. The building drain and urea tank containments have discharge valves that are always in the closed position except when manually opened for discharging collected storm water. Only in the improbable case where the discharge valve is left open and a spill were to occur would these stored liquids escape the containment. With daily inspections of the valves as described below, a spill reaching surface waters is highly improbable. However, the Project's Hazardous Materials Release Response Plan prepared for Butte County would be implemented in the unlikely event a spill were to occur. In the event of a tank leak or rupture, the containment area would be evacuated by a vacuum truck and the liquid recycled or disposed of at an authorized facility.

F.4. Inspections

Storm water levels in the gas well valve vaults are monitored and inspected weekly by qualified members of the Pollution Prevention Team during the rainy season, except when the site is inundated by flood waters. Between scheduled maintenance activities, visual inspections of tanks, valves and flanges at the Remote Facility Site are conducted daily for leakage or seepage. Prior to pumping or manually releasing storm water from containment structures to the ground, the operator inspects the contained water for evidence of an oil sheen. If a sheen is observed, absorbent pads are placed on the water surface to remove the visible sheen prior to discharge. At the Well Pad Site, the operator inspects for evidence of oil sheen on the contained water in the vault prior to pumping and the collected water prior to opening the gate valve to release it into the adjacent wetlands. In all cases, if the oil sheen or other obvious pollutants are greater than can be removed by absorbent pads, a vacuum truck is called to remove the collected storm water.

F.5. Employee Training

Employee training is conducted to provide information on general good housekeeping procedures, material transfer procedures (tank filling and draining) inspection procedures, sampling and visual observations techniques, and performing visual inspections for sheen on collected storm water. This training has been incorporated into the existing operational training module provided to staff upon employment and then on an on-going basis as either conditions change or new equipment is installed.

F.6. Record Keeping and Reporting

Record keeping and reporting procedures have been established for two specific situations:

- Spills: For any oil spill which reaches a water body, the spill will be reported to the National Response Center at (800) 424-8802 (24 hours) and to Butte County Health Department consistent with the Project's Hazardous Materials Release Response Plan. The report will include a description of incidents (such as spills or other discharges), along with other information describing the quality and quantity of discharges, responsible parties, date and

time of incident, weather conditions, duration and cause of spill/leak/discharge, response procedures, resulting environmental problems and persons notified.

- Routine inspections and maintenance: Regular inspections and maintenance are documented and records are maintained at the Project office. Documentation includes the date and time the inspection or maintenance was performed, the name of the staff, the equipment or facility maintained or inspected, any corrective action required, and the date the corrective action will be or was taken.

F.7. Sediment and Erosion Control

The topography surrounding the Remote Facility Site and the Well Pad Site is very flat, hence there is virtually no potential for soil erosion associated with the discharges. The discharges at the Remote Facility Site are to the gravel surface either by gravity or by pumps, both of which can be controlled and directed to ensure erosion does not occur. At the Well Pad Site the gate valve controls the flow through a culvert to an existing wetland management waterway, and the flow rate is monitored to ensure the discharge does not erode the waterway.

F.8. Management of Runoff

Given the nature of the structures that are sources of storm water discharges, Wild Goose considers the current storm water management and pollution prevention practices the most appropriate and practicable methods to reduce pollutants in discharges from the Remote Facility Site. Since the Well Pad Site is inundated by flood waters almost every year, there is no means of precluding storm water contact with the valves. Similarly, there are no opportunities to divert or reuse the storm water runoff on the Project.

G. Comprehensive Site Compliance Evaluation

G.1. Discharge Site Compliance Evaluation

Employees visually inspect for evidence of, or the potential for, pollutants as part of the routine inspections and during each discharge. The existing measures to reduce pollutant loadings are considered adequate and properly implemented. Due to the nature of the structures that are sources of storm water discharges, there are no structural wastewater management measures, sediment and erosion control measures, or other structural pollution prevention practices associated with the storm water discharge at the Project.

G.2. Required Plan Revisions

WGSI will revise this Plan whenever there is a change in operation or maintenance, or when such an amendment is necessary to ensure compliance with BAT or BCT and receiving water limits. The Plan will also be amended if it is in violation of any conditions of the General Permit or has not achieved the objective of controlling pollutants in discharges to surface waters. The amended Plan will be certified in accordance with the prescribed signatory requirements and retained in the Project files for three years.

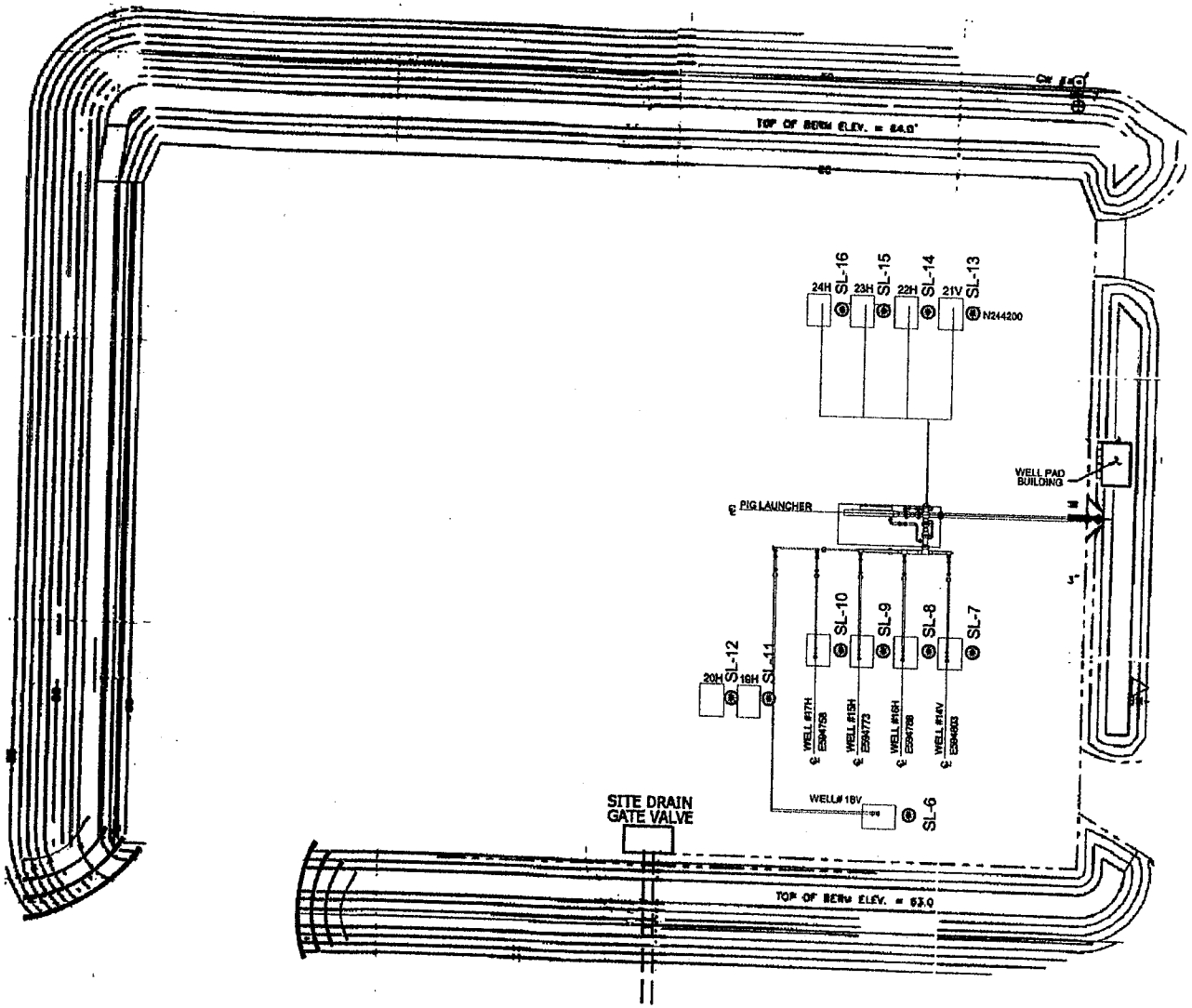
Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Wayne Marlian

Wayne Marlian, Superintendent of US Gas Storage
Wild Goose Storage Inc./EnCana Corporation

10/10/06
Date



KEY

SL-0 ⊕ = Sampling Locations

not to scale

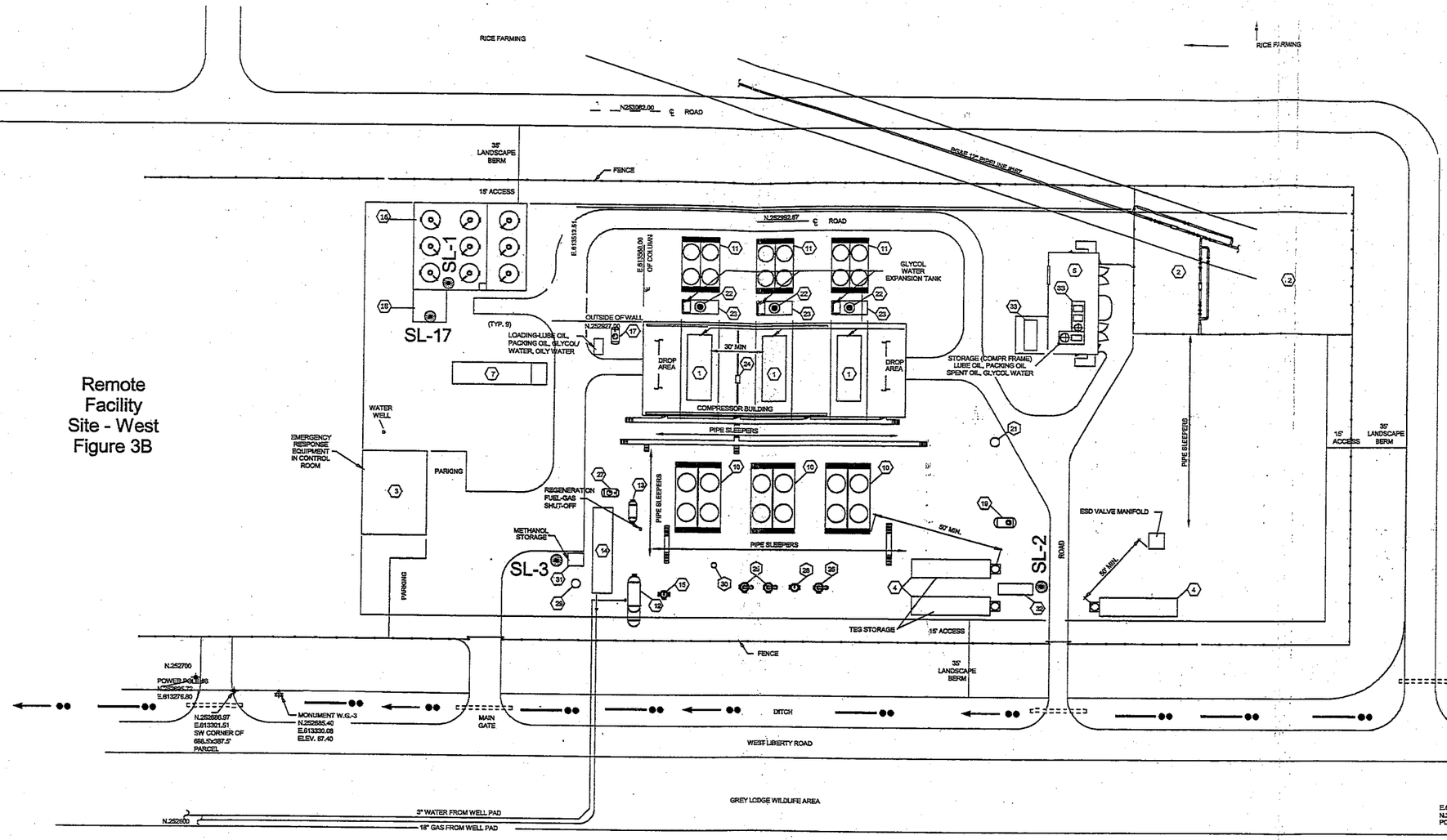
Figure 2

Well Pad Site Sampling Locations

Pollution Prevention Plan

Wild Goose Storage Inc. - Matrix Environmental Planning - September 2006

Remote Facility Site - West Figure 3B



N

0 100
Scale in Feet

KEY

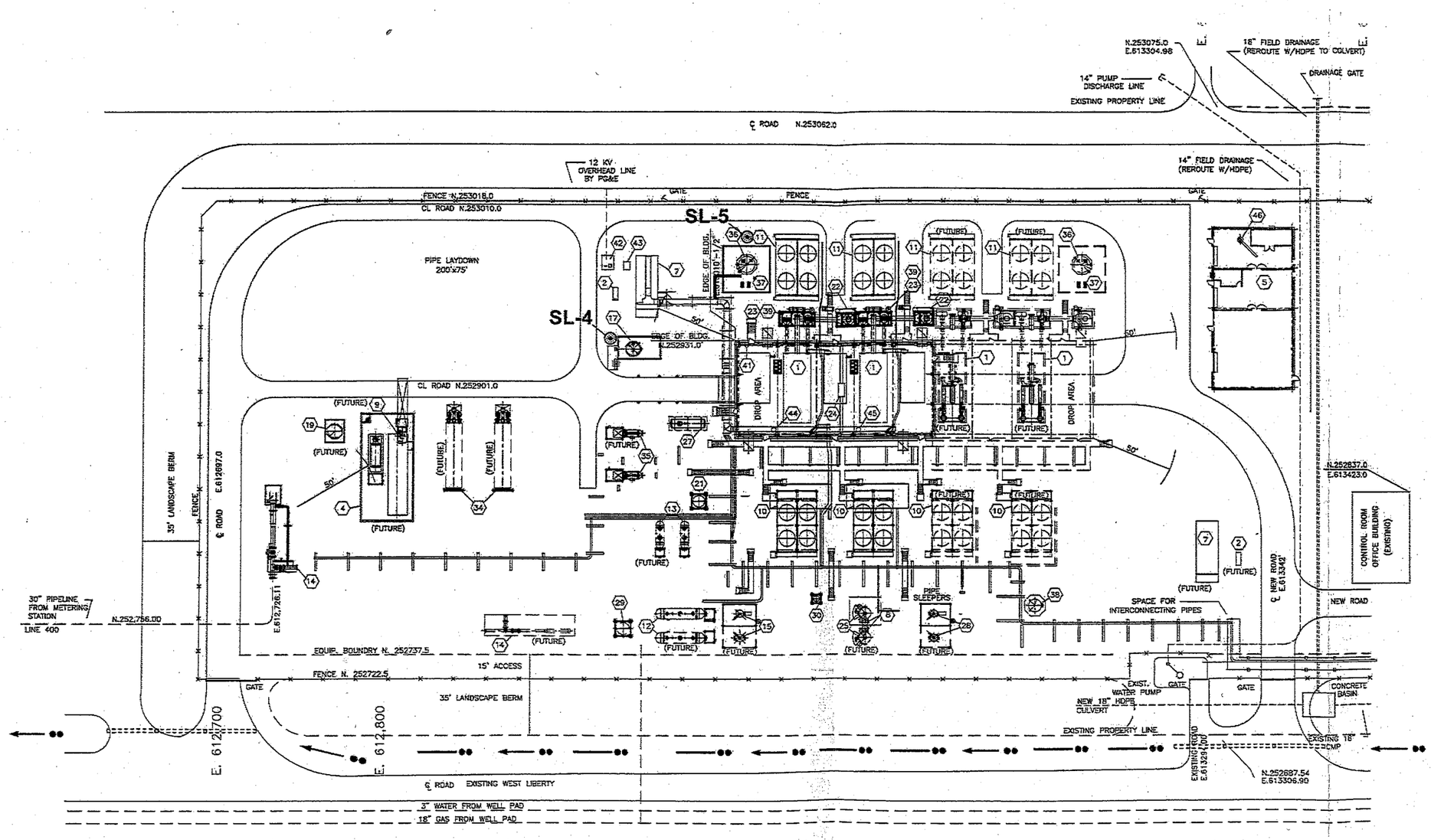
SL-0 ⊛ = Sampling Locations

LEGEND

1. COMPRESSOR UNITS
2. PG&E INTERCONNECTS (METER, INSTRUMENT BUILDING & ODORIZER)
3. CONTROL ROOM / OFFICE BLDG.
4. GLYCOL REGENERATION
5. MECHANICAL BUILDING
7. PDC / STAND-BY GENERATOR
10. COMPRESSOR GAS COOLERS
11. COMPRESSOR JACKET WATER COOLERS
12. INLET SEPARATOR
13. DISCHARGE SCRUBBER
14. PIG RECEIVER
15. PROCESS WATER TANKS
16. PRODUCED WATER TANKS
17. OILY WATER DRAIN WITH SECONDARY CONTAINMENT
18. INJECTION WELL SKID CONTAINMENT
19. GLYCOL DRAIN TANK WITH SECONDARY CONTAINMENT
21. BLOWDOWN VENT SILENCER
22. ENGINE EXHAUSTS
23. COMBUSTION AIR INTAKES
24. OVERHEAD BRIDGE CRANE
25. GLYCOL CONTRACTOR TOWERS
27. PROCESS DRAIN TANK WITH SECONDARY CONTAINMENT
28. GLYCOL CONTACTOR AFTER SCRUBBER
29. BLOWDOWN VENT SILENCER
30. BLOWDOWN VENT SILENCER
31. METHANOL INJECTION SYSTEM
32. THERMAL OXIDIZER
33. INSTRUMENT AIR COMPRESSOR

Figure 3A

Remote Facility Site - East
Sampling Locations
Pollution Prevention Plan



Key

SL-0 ◎ = Sampling Locations

Remote Facility
Site - East
Figure 3A

1. INJECTION COMPRESSOR PACKAGE C-101A/B-2
2. EMERGENCY GENERATOR G1-2
4. DEHY REGENERATION PACKAGE U-201B-3
5. SHOPS / WAREHOUSE BUILDING
7. PDC
8. TEG GLYCOL/GAS EXCHANGER U-201A-2/3-E1
9. GLYCOL DRAIN PUMP P-303-3
10. DISCHARGE GAS COOLER C-101A/B-2 A1
11. COMPRESSOR JACKET WATER COOLERS
12. INLET SEPARATOR V-103-2/3
13. DISCHARGE SCRUBBER V-103-2/3
14. PIG RECEIVER (BY REI) V-203-2
15. PROCESS GAS FILTER V-204-2/3
17. BUILDING DRAIN TANK T-301-2
19. GLYCOL DRAIN TANK T-303-3 (TEG STORAGE DURING SHUTDOWN)
21. COMPRESSOR AREA BLOWDOWN VENT/SILENCER X-201-2
22. SCR / EXHAUST
23. COMBUSTION AIR INTAKES
24. COMPRESSOR BUILDING BRIDGE CRANE CR-101-2
25. TEG CONTACTORS U-201A-2/3-V1
27. PROCESS DRAIN TANK T-302-2 (BURIED)
28. GLYCOL CONTACTOR AFTER SCRUBBER V-205-2/3
29. INLET AREA BLOWDOWN VENT / SILENCER X-202-2
30. DEHYDRATION AREA BLOWDOWN VENT / SILENCER X-203-2
34. LINE HEATERS H-200/1-3
35. INLET FILTER / SEPARATOR V-101-2/3
36. AQUEOUS UREA STORAGE TANK T-101-2
37. AQUEOUS UREA TRANSFER PUMP P-101-2
38. INSTRUMENT AIR RECEIVER V-301-2
39. UREA SKID
41. COMPRESSOR BLDG. SUMP/PUMP P-301-2
42. POWER TRANSFORMER (BY PG&E)
43. POWER METER PEDESTAL (BY PG&E)
44. START GAS VENT SILENCER X-204-2
45. START GAS VENT SILENCER X-205-2
46. SHOPS / WAREHOUSE JIB CRANE CR-102-2

Figure - 3B

Remote Facility Site - West Sample Locations
Pollution Prevention Plan

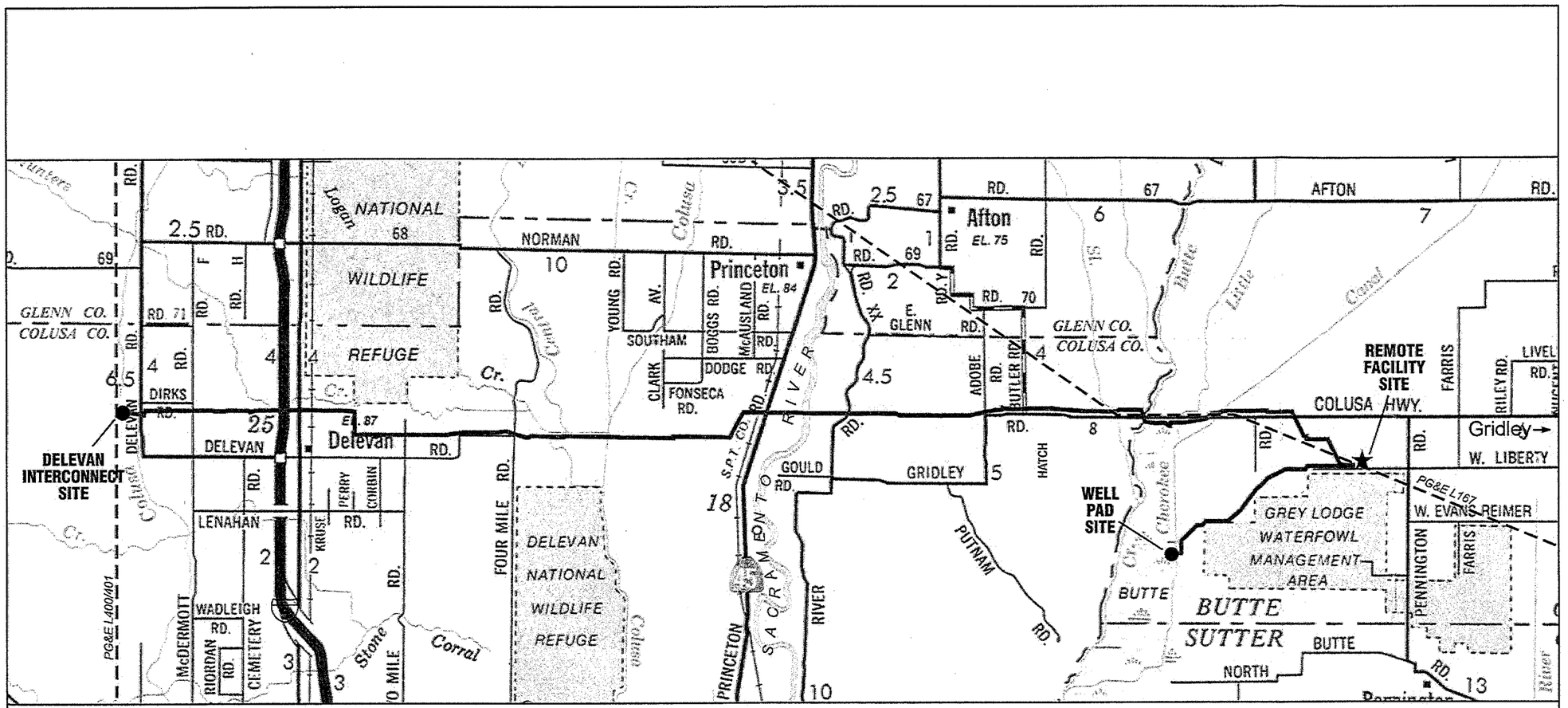


Figure - 1

Project Location

Pollution Prevention Plan

Wild Goose Storage Inc. - Matrix Environmental Planning - September 2006

Ashland Chemical Co.

Date Prepared: 01/05/96
Date Printed: 09/28/96
MSDS No: 0001447-007.001

METHANOL

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity
Product Name: METHANOL
General or Generic ID: ALCOHOL

Company
Ashland Chemical Co.
P.O. Box 2219
Columbus, OH 43216
614-790-3333

Emergency Telephone Number:
1-800-ASHLAND (1-800-274-5263)
24 hours everyday

Regulatory Information Number:
1-800-325-3751

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by weight)
METHYL ALCOHOL	67-56-1	100.0

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye
Exposure may cause mild eye irritation. Symptoms may include stinging, tearing, and redness.

Skin
Exposure may cause mild skin irritation. Prolonged or repeated exposure may dry the skin. Symptoms may include redness, burning, drying and cracking, and skin burns. Skin absorption is possible, and may contribute to symptoms of toxicity from other routes of exposure.

Swallowing
Single dose oral toxicity is moderate. Swallowing may be harmful.

Inhalation
Exposure to vapor or mist is possible. Short-term inhalation toxicity is low. Breathing small amounts during normal handling is not likely to cause harmful effects; breathing large amounts may be harmful. Symptoms are more typically seen at air concentrations exceeding the recommended exposure limits.

Symptoms of Exposure
gastrointestinal irritation (nausea, vomiting, diarrhea), irritation (nose, throat, respiratory tract), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), leg cramps, abdominal and low back pain, blurred vision, shortness of breath, cyanosis (characterized by bluish discoloration of the skin and nails), visual impairment (including blindness), coma, and death.

Target Organ Effects
Exposure to lethal concentrations of methanol has been shown to cause damage to organs including liver, kidneys, pancreas, heart, lungs and brain. Although this rarely occurs, survivors of severe intoxication may suffer from permanent neurological damage. Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals, and may aggravate pre-existing disorders of these organs in humans: central nervous system damage, Overexposure to this material (or its components) has

Continued on next page

been suggested as a cause of the following effects in humans, and may aggravate pre-existing disorders of these organs: visual impairment.

Developmental Information
While there is sufficient evidence that methanol causes birth defects in experimental animals, the relevance of these findings to humans is uncertain because of differences in metabolism and toxicity of methanol between humans and non-primates.

Cancer Information
No data

Other Health Effects
No data

Primary Route(s) of Entry
Inhalation, Skin absorption, Skin contact, Eye contact.

4. FIRST AID MEASURES

Eyes
If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention.

Skin
Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Swallowing
If swallowed, seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. If individual is conscious and alert, induce vomiting by giving syrup of ipecac or by gently placing two fingers at the back of the throat. If possible, do not leave individual unattended.

Inhalation
If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.

Note to Physicians
This product contains methanol which can cause intoxication and central nervous system depression. Methanol is metabolized to formic acid and formaldehyde. These metabolites can cause metabolic acidosis, visual disturbances and blindness. Since metabolism is required for these toxic symptoms, their onset may be delayed from 6 to 30 hours following ingestion. Ethanol competes for the same metabolic pathway and has been used to prevent methanol metabolism. Ethanol administration is indicated in symptomatic patients or at blood methanol concentrations above 20 ug/dl. Methanol is effectively removed by hemodialysis.

Continued on next page

5. FIRE FIGHTING MEASURES

Flash Point
54.0 F (12.2 C) TCC

Explosive Limit
(for product) Lower 6.0 % Upper 36.0 %

Autoignition Temperature
725.0 F

Hazardous Products of Combustion
May form: carbon dioxide and carbon monoxide.

Fire and Explosion Hazards
Vapors are heavier than air and may travel along the ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, static discharge, or other ignition sources at locations distant from material handling point. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.

Extinguishing Media
alcohol foam, carbon dioxide, dry chemical.

Fire Fighting Instructions
Water may be ineffective. Water may be used to keep fire-exposed containers cool until fire is out. Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment. Refer to the personal protective equipment section of this MSDS.

NFPA Rating
Health - 1, Flammability - 3, Reactivity - 0

6. ACCIDENTAL RELEASE MEASURES

Small Spill
Absorb liquid on vermiculite, floor absorbent or other absorbent material.

Large Spill
Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal. Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occurred.

7. HANDLING AND STORAGE

Handling
Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. All five gallon pails

Continued on next page

and larger metal containers including tank cars and tank trucks should be grounded and/or bonded when material is transferred. Warning. Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection

Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Skin Protection

Wear resistant gloves (consult your safety equipment supplier)., To prevent repeated or prolonged skin contact, wear impervious clothing and boots..

Respiratory Protections

If workplace exposure limit(s) of product or any component is exceeded (see exposure guidelines), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (see your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

Engineering Controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).

Exposure Guidelines

Component

METHYL ALCOHOL (67-56-1)
OSHA VPEL 200.000 ppm - TWA (Skin)
OSHA VPEL 250.000 ppm - STEL (Skin)
ACGIH TLV 200.000 ppm - TWA (Skin)
ACGIH TLV 250.000 ppm - STEL (Skin)

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point

(for product) 147.0 F (63.8 C) @ 760 mmHg

Vapor Pressure

(for product) 41.600 mmHg @ 68.00 F

Continued on next page

Specific Vapor Density
1.110 @ AIR=1

Specific Gravity
.795 @ 68.00 F

Liquid Density
6.630 lbs/gal @ 60.00 F
.795 kg/l @ 15.60 C

Percent Volatiles
100.0 %

Volatile Organic Compounds (VOC)
100.000 %
795.000 g/l
6.630 lbs/gal

Evaporation Rate
2.10 (N-BUTYL ACETATE)

Appearance
CLEAR, COLORLESS MOBILE LIQUID

State
LIQUID

Physical Form
NEAT

Color
CLEAR, APHA COLOR 5 MAX

Odor
MILD ALCOHOL

pH
No data

Viscosity
.6 cps

Freezing Point
-144.0 F (-97.7 C)

Molecular Weight
32.0

Solubility in Water
COMPLETE

Bulk Density
.890 lbs/ft3

10. STABILITY AND REACTIVITY

Hazardous Polymerization
Product will not undergo hazardous polymerization.

Continued on next page

Hazardous Decomposition
May form: carbon dioxide and carbon monoxide.

Chemical Stability
Stable.

Incompatibility
Avoid contact with: reactive metals such as aluminum and magnesium, strong acids, strong oxidizing agents.

11. TOXICOLOGICAL INFORMATION

No data

12. ECOLOGICAL INFORMATION

No data

13. DISPOSAL CONSIDERATION

Waste Management Information
Dispose of in accordance with all applicable local, state and federal regulations.

14. TRANSPORT INFORMATION

DOT Information - 49 CFR 172.101
DOT Description:
METHANOL,3 (FLAMMABLE LIQUID),UN1230,II

Container/Mode:
55 GAL DRUM/TRUCK PACKAGE

NOS Component:
None

RQ (Reportable Quantity) - 49 CFR 172.101

Product Quantity (lbs)	Component
5000	METHANOL

15. REGULATORY INFORMATION

US Federal Regulations
TSCA (Toxic Substances Control Act) Status
TSCA (UNITED STATES) The intentional ingredients of this product are listed.

Continued on next page

CERCLA RQ - 40 CFR 302.4

Component	RQ (lbs)
METHYL ALCOHOL	5000

SARA 302 Components - 40 CFR 355 Appendix A
None

Section 311/312 Hazard Class - 40 CFR 370.2
Immediate(X) Delayed(X) Fire(X) Reactive( ) Sudden Release of Pressure( )

SARA 313 Components - 40 CFR 372.65

Section 313 Component(s)	CAS Number	Max %
METHANOL	67-56-1	100.00

International Regulations
Inventory Status
DSL (CANADA) The intentional ingredients of this product are listed.
EINECS (EUROPE) The intentional ingredients of this product are listed.
TCCL (KOREA) The intentional ingredients of this product are listed.

State and Local Regulations
California Proposition 65
None

New Jersey RTK Label Information
METHYL ALCOHOL 67-56-1

Pennsylvania RTK Label Information
METHANOL 67-56-1

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

Post-it™ brand fax transmittal memo 7671 | # of pages ▸

To Wayne Marchant	From Dave Taylor
Co. United Geox GAS -	Co.
Dept.	Phone # 530-846-7350
Fax #	Fax #

PRODUCT NAME:
TRIETHYLENE GLYCOL TECHNICAL - E

MSDS #: DW24758

2. COMPOSITION/INFORMATION ON INGREDIENTS

TRIETHYLENE GLYCOL	CAS# 000112-27-6	98% (MIN)
DIETHYLENE GLYCOL	CAS# 000111-46-6	1% (MAX)

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

****
* COLORLESS LIQUID. SLIGHT ODOR. NO SIGNIFICANT IMMEDIATE HAZARDS FOR *
* EMERGENCY RESPONSE ARE KNOWN. *
*
****

POTENTIAL HEALTH EFFECTS (SEE SECTION 11 FOR TOXICOLOGICAL DATA.)

EYE: MAY CAUSE SLIGHT TRANSIENT (TEMPORARY) EYE IRRITATION. MISTS MAY CAUSE EYE IRRITATION.

SKIN CONTACT: PROLONGED OR REPEATED EXPOSURE MAY CAUSE SKIN IRRITATION. MAY CAUSE MORE SEVERE RESPONSE IF SKIN IS ABRADED (SCRATCHED OR CUT).

SKIN ABSORPTION: A SINGLE PROLONGED EXPOSURE IS NOT LIKELY TO RESULT IN THE MATERIAL BEING ABSORBED THROUGH SKIN IN HARMFUL AMOUNTS. MASSIVE CONTACT WITH DAMAGED SKIN OR OF MATERIAL SUFFICIENTLY HOT TO BURN SKIN MAY RESULT IN ABSORPTION OF POTENTIALLY LETHAL AMOUNTS.

INGESTION: SINGLE DOSE ORAL TOXICITY IS LOW. INGESTION OF LARGE AMOUNTS MAY CAUSE INJURY. THE ORAL LD50 FOR RATS IS 16,800 - 22,060 MG/KG.

INHALATION: AT ROOM TEMPERATURE, VAPORS ARE MINIMAL DUE TO PHYSICAL PROPERTIES. MISTS MAY CAUSE IRRITATION OF UPPER RESPIRATORY TRACT. THE LC50 FOR RATS IS GREATER THAN 4.5 MG/LITER AS AN AEROSOL.

SYSTEMIC & OTHER EFFECTS: BASED ON AVAILABLE DATA, REPEATED EXPOSURES ARE NOT EXPECTED TO CAUSE SIGNIFICANT ADVERSE EFFECTS EXCEPT AT VERY HIGH AEROSOL CONCENTRATIONS. REPEATED EXCESSIVE EXPOSURES MAY CAUSE RESPIRATORY TRACT IRRITATION AND EVEN DEATH.

CANCER INFORMATION: DID NOT CAUSE CANCER IN LONG-TERM ANIMAL STUDIES.

TERATOLOGY (BIRTH DEFECTS): BIRTH DEFECTS ARE UNLIKELY. IN LABORATORY ANIMALS HOWEVER, EXPOSURES HAVING NO ADVERSE EFFECTS ON THE MOTHER HAD OTHER HARMFUL EFFECTS ON THE FETUS. HAS BEEN TOXIC TO THE FETUS IN LABORATORY ANIMALS AT DOSES NONTOXIC TO THE MOTHER. (ORAL GAVAGE ROUTE IN MICE). HAS BEEN TOXIC TO THE FETUS IN LABORATORY ANIMALS AT DOSES TOXIC TO THE MOTHER. (ORAL GAVAGE ROUTE IN RATS). DOSE LEVELS PRODUCING THESE EFFECTS WERE MANY TIMES HIGHER THAN ANY DOSE LEVELS EXPECTED FROM EXPOSURE DUE TO USE.

REPRODUCTIVE EFFECTS: IN ANIMAL STUDIES, HAS BEEN SHOWN NOT TO INTERFERE WITH REPRODUCTION.

4. FIRST AID

EYES: FLUSH EYES WITH PLENTY OF WATER.

SKIN: WASH OFF IN FLOWING WATER OR SHOWER.

INGESTION: INDUCE VOMITING IF LARGE AMOUNTS ARE INGESTED. CONSULT MEDICAL PERSONNEL.

INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. CONSULT A PHYSICIAN.

NOTE TO PHYSICIAN: NO SPECIFIC ANTIDOTE. SUPPORTIVE CARE. TREATMENT BASED ON JUDGMENT OF THE PHYSICIAN IN RESPONSE TO THE PATIENT.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERIES
FLASH POINT: 350F; 177C
METHOD USED: PMCC
AUTOIGNITION TEMPERATURE: NOT AVAILABLE

FLAMMABILITY LIMITS
LFL: 0.9%
UFL: 9.2%

HAZARDOUS COMBUSTION PRODUCT:

EXTINGUISHING MEDIA: WATER FOG, ALCOHOL RESISTANT FOAM, CO2, DRY CHEMICAL.

FIRE FIGHTING INSTRUCTIONS: NO FIRE AND EXPLOSION HAZARDS EXPECTED UNDER NORMAL STORAGE AND HANDING CONDITIONS (I.E. AMBIENT TEMPERATURES) HOWEVER, TRIETHYLENE GLYCOL OR SOLUTIONS OF TRIETHYLENE GLYCOL AND WATER CAN FORM FLAMMABLE VAPORS WITH AIR IF HEATED SUFFICIENTLY.

PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS.

6. ACCIDENTAL RELEASE MEASURES (SEE SECTION 15 FOR REGULATORY INFORMATION)

PROTECT PEOPLE: CLEAR NON-EMERGENCY PERSONNEL FROM AREA.

PROTECT THE ENVIRONMENT: DO NOT DISCHARGE INTO SEWERS AND/OR NATURAL WATER.

CLEANUP: SMALL SPILLS: SOAK UP WITH ABSORBENT MATERIAL AND COLLECT FOR DISPOSAL. LARGE SPILLS: DIKE TO PREVENT CONTAMINATION OF WATERWAYS, THEN PUMP INTO SUITABLE CONTAINERS FOR DISPOSAL.

7. HANDLING AND STORAGE

HANDLING: PRACTICE REASONABLE CARE TO AVOID EXPOSURE.

STORAGE: THIS PRODUCT HAS A SHELF LIFE OF APPROXIMATELY 6 MONTHS IN AN UNLINED BULK STEEL TANK AT AMBIENT CONDITIONS. THE SHELF LIFE CAN BE UP TO 12 MONTHS IF THE BULK TANK OR DRUM IS LINED. HIGH COLOR AND A DROP IN PH ARE SIGNS THAT THE PRODUCT IS STARTING TO DETERIORATE. IF SIGNS OF DETERIORATION ARE STARTING TO OCCUR, THE CUSTOMER NEEDS TO VERIFY THAT THE MATERIAL STILL

MEETS SPECIFICATIONS PRIOR TO USE. SEE DOW'S "A GUIDE TO GLYCOLS" FOR FURTHER INFORMATION ON STORAGE OF GLYCOLS.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: GOOD GENERAL VENTILATION SHOULD BE SUFFICIENT FOR MOST CONDITIONS. LOCAL EXHAUST VENTILATION MAY BE NECESSARY FOR SOME OPERATIONS.

PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION: USE SIDE SHIELD SAFETY GLASSES OR MONOGOGGLES AS MINIMUM EYE PROTECTION.

SKIN PROTECTION: WHEN PROLONGED OR FREQUENTLY REPEATED CONTACT COULD OCCUR, USE PROTECTIVE CLOTHING IMPERVIOUS TO THIS MATERIAL. SELECTION OF SPECIFIC ITEMS SUCH AS GLOVES, BOOTS, APRON OR FULL-BODY SUIT WILL DEPEND ON OPERATION. IF HANDS ARE CUT OR SCRATCHED, USE GLOVES IMPERVIOUS TO THIS MATERIAL EVEN FOR BRIEF EXPOSURES. WHEN HANDLING HOT MATERIAL, PROTECT SKIN FROM THERMAL BURNS AS WELL AS FROM SKIN ABSORPTION. SAFETY SHOWER SHOULD BE LOCATED IN IMMEDIATE WORK AREA. REMOVE CONTAMINATED CLOTHING IMMEDIATELY, WASH SKIN AREA WITH SOAP AND WATER, AND LAUNDER CLOTHING BEFORE REUSE.

RESPIRATORY PROTECTION: IN MISTY ATMOSPHERES, USE AN APPROVED MIST RESPIRATOR.

EXPOSURE GUIDELINE: NONE ESTABLISHED.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: COLORLESS LIQUID.
ODOR: SLIGHT
VAPOR PRESSURE: < 1.0 MMHG @ 20C
VAPOR DENSITY: 5.18
BOILING POINT: 543 DF, 284C
SOLUBILITY IN WATER: COMPLETELY MISCIBLE
SPECIFIC GRAVITY: 1.1225 @ 25/25C
FREEZE POINT: -7.2C (19F)

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: WILL IGNITE IN AIR AT 700F.

CONDITIONS TO AVOID: NONE KNOWN.

INCOMPATIBILITY WITH OTHER MATERIALS: OXIDIZING MATERIAL. AVOID CONTAMINATION WITH STRONG OXIDIZERS AND MATERIALS THAT WILL REACT WITH HYDROXYL COMPOUNDS. AVOID STRONG ACIDS AND BASES AT ELEVATED TEMPERATURES SINCE THIS MAY RESULT IN EXPLOSIVE DECOMPOSITION.

HAZARDOUS DECOMPOSITION PRODUCTS: BURNING PRODUCES NORMAL PRODUCTS OF COMBUSTION, INCLUDING CARBON MONOXIDE, CARBON DIOXIDE, AND WATER.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

11. TOXICOLOGICAL INFORMATION (SEE SECTION 3 FOR POTENTIAL HEALTH

EFFECTS. FOR DETAILED TOXICOLOGICAL DATA, WRITE OR CALL THE

ADDRESS OR NON-EMERGENCY NUMBER SHOWN IN SECTION 1)

SKIN: THE LD50 FOR SKIN ABSORPTION IN RABBITS IS GREATER THAN 5000 MG/KG.

INGESTION: THE ORAL LD50 FOR RATS IS 16,800-22,060 MG/KG.

INHALATION: THE LC50 FOR RATS IS GREATER THAN 4.5 MG/LITER AS AN AEROSOL.

MUTAGENICITY: IN VITRO MUTAGENICITY STUDIES WERE NEGATIVE.

12. ECOLOGICAL INFORMATION (FOR DETAILED ECOLOGICAL DATA, WRITE OR CALL THE ADDRESS OR NON-EMERGENCY NUMBER SHOWN IN SECTION 1)

13. DISPOSAL CONSIDERATIONS (SEE SECTION 15 FOR REGULATORY INFORMATION)

DISPOSAL METHOD: BURN IN AN APPROVED INCINERATOR IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS.

14. TRANSPORT INFORMATION

FOR TDG REGULATORY INFORMATION, IF REQUIRED, CONSULT TRANSPORTATION REGULATIONS, PRODUCT SHIPPING PAPERS, OR YOUR DOW REPRESENTATIVE.

FOR DOT REGULATORY INFORMATION, IF REQUIRED, CONSULT TRANSPORTATION REGULATIONS, PRODUCT SHIPPING PAPERS, OR YOUR DOW REPRESENTATIVE.

15. REGULATORY INFORMATION (NOT MEANT TO BE ALL-INCLUSIVE--SELECTED REGULATIONS REPRESENTED)

NOTICE: THE INFORMATION HEREIN IS PRESENTED IN GOOD FAITH AND BELIEVED TO BE ACCURATE AS OF THE EFFECTIVE DATE SHOWN ABOVE. HOWEVER, NO WARRANTY, EXPRESS OR IMPLIED IS GIVEN. REGULATORY REQUIREMENTS ARE SUBJECT TO CHANGE AND MAY DIFFER FROM ONE LOCATION TO ANOTHER; IT IS THE BUYER'S RESPONSIBILITY TO ENSURE THAT ITS ACTIVITIES COMPLY WITH FEDERAL, STATE OR PROVINCIAL, AND LOCAL LAWS. THE FOLLOWING SPECIFIC INFORMATION IS MADE FOR THE PURPOSE OF COMPLYING WITH NUMEROUS FEDERAL, STATE OR PROVINCIAL, AND LOCAL LAWS AND REGULATIONS. SEE OTHER SECTIONS FOR HEALTH AND SAFETY INFORMATION.

SARA HAZARD CATEGORY: THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA "HAZARD CATEGORIES" PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:

NOT TO HAVE MET ANY HAZARD CATEGORY

TOXIC SUBSTANCES CONTROL ACT (TSCA):

ALL INGREDIENTS ARE ON THE TSCA INVENTORY OR ARE NOT REQUIRED TO BE LISTED ON THE TSCA INVENTORY.

STATE RIGHT-TO-KNOW: THE FOLLOWING PRODUCT COMPONENTS ARE CITED ON CERTAIN STATE LISTS AS MENTIONED. NON-LISTED COMPONENTS MAY BE SHOWN IN THE COMPOSITION SECTION OF THE MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
DIETHYLENE GLYCOL	000111-46-6	PA1
TRIETHYLENE GLYCOL	000112-27-6	PA1

PA1=PENNSYLVANIA HAZARDOUS SUBSTANCE (PRESENT AT GREATER THAN OR EQUAL TO 1.0%).

OSHA HAZARD COMMUNICATION STANDARD:

THIS PRODUCT IS NOT A "HAZARDOUS CHEMICAL" AS DEFINED BY THE OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200.

CANADIAN REGULATIONS

WHMIS INFORMATION: THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) CLASSIFICATION FOR THIS PRODUCT IS:

D2A - MATERIAL IS TERATOGENIC, EMBRYOTOXIC, OR FETOTOXIC
REFER ELSEWHERE IN THE MSDS FOR SPECIFIC WARNINGS AND SAFE HANDLING INFORMATION. REFER TO THE EMPLOYER'S WORKPLACE EDUCATION PROGRAM.

- - - - -

CPR STATEMENT: THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS (CPR) AND THE MSDS CONTAINS ALL THE INFORMATION REQUIRED BY THE CPR.

- - - - -

HAZARDOUS PRODUCTS ACT INFORMATION: THIS PRODUCT CONTAINS THE FOLLOWING INGREDIENTS WHICH ARE CONTROLLED PRODUCTS AND/OR ON THE INGREDIENT DISCLOSURE LIST (CANADIAN HPA SECTION 13 AND 14):

COMPONENTS:	CAS #	AMOUNT(%W/W)
TRIETHYLENE GLYCOL	CAS# 112-27-4	98%

---

16. OTHER INFORMATION

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

CATEGORY	RATING
HEALTH	1
FLAMMABILITY	1
REACTIVITY	0

MSDS STATUS: REVISED SECTIONS 3, 7,, 11

---------- NOTICE ----------

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SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VW&RS CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND TH ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON , INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

* * * E N D O F M S D S * * *

Material Safety Data Sheet

- Click on the product name to go to the Salesfax description sheet.
- Click on the grade to go to the Salesfax typical test data sheet.

Chevron Clarity® Hydraulic Oil AW ISO 32, 46, 68

MSDS: 6691 **Revision #:** 0 **Revision Date:** 04/18/97

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

CHEVRON Clarity Hydraulic Oil AW

PRODUCT NUMBER(S): CPS230340 CPS230341 CPS230342
SYNONYM: CHEVRON Clarity Hydraulic Oil AW ISO 32
CHEVRON Clarity Hydraulic Oil AW ISO 46
CHEVRON Clarity Hydraulic Oil AW ISO 68

COMPANY IDENTIFICATION

Chevron Products Company
Global Lubricants
555 Market St.
Room 803
San Francisco, CA 94105-2870

EMERGENCY TELEPHONE NUMBERS

HEALTH (24 hr): (800)231-0623 or
(510)231-0623 (International)
TRANSPORTATION (24 hr): CHEMTREC
(800)424-9300 or (703)527-3887
Int'l collect calls accepted

PRODUCT INFORMATION: MSDS Requests: (800) 228-3500
Environmental, Safety, & Health Info: (415) 894-0703
Product Information: (800) 582-3835
SPECIAL NOTES: This MSDS is for the entire line of CHEVRON Clarity Hydraulic Oil AW products.

2. COMPOSITION/INFORMATION ON INGREDIENTS

100.0 % CHEVRON Clarity Hydraulic Oil AW

CONTAINING

COMPONENTS	AMOUNT	LIMIT/QTY	AGENCY/TYPE
HYDROTREATED DIST., HVY PARA			
Chemical Name: DISTILLATES, HYDROTREATED HEAVY PARAFFINIC			
CAS64742547	> 99.00%	5 mg/m3 (mist)	ACGIH TWA
		10 mg/m3 (mist)	ACGIH STEL
		5 mg/m3 (mist)	OSHA PEL
ADDITIVES	< 1.00%		

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

* This product fits the ACGIH definition for mineral oil mist. The ACGIH TLV is 5 mg/m3, the OSHA PEL is 5 mg/m3.

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3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS
EYE:
Not expected to cause prolonged or significant eye irritation.
SKIN:
Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.
INGESTION:
Not expected to be harmful if swallowed.
INHALATION:
Contains a petroleum-based mineral oil that may cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of airborne levels above the recommended exposure limit.

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4. FIRST AID MEASURES

EYE:
No specific first aid measures are required because this material is not expected to cause eye irritation. As a precaution remove contact lenses, if worn, and flush eyes with water.
SKIN:
No specific first aid measures are required because this material is not expected to be harmful if it contacts the skin. As a precaution, remove clothing and shoes if contaminated. Use a waterless hand cleaner, mineral oil, or petroleum jelly to remove the material. Then wash skin with soap and water. Wash or clean contaminated clothing and shoes before reuse.
INGESTION:
No specific first aid measures are required because this material is not expected to be harmful if swallowed. Do not induce vomiting. As a precaution, give the person a glass of water or milk to drink and get medical advice. Never give anything by mouth to an unconscious person.
INHALATION:
If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.
NOTE TO PHYSICIANS:
In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

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5. FIRE FIGHTING MEASURES

SPECIAL NOTES: Leaks/ruptures in high pressure system using materials of this type can create a fire hazard when in the vicinity of ignition sources (eg. open flame, pilot lights, sparks, or electric arcs).
FIRE CLASSIFICATION:
Classification (29 CFR 1910.1200): Not flammable or combustible.
FLAMMABLE PROPERTIES:
FLASH POINT: (COC) 374-428F (190-220C) Min.
AUTOIGNITION: NDA
FLAMMABILITY LIMITS (% by volume in air): Lower: NA Upper: NA
EXTINGUISHING MEDIA:
CO2, Dry Chemical, Foam, Water Fog
NFPA RATINGS: Health 0; Flammability 1; Reactivity 0.
FIRE FIGHTING INSTRUCTIONS:
This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
COMBUSTION PRODUCTS:
Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

6. ACCIDENTAL RELEASE MEASURES

CHEMTREC EMERGENCY NUMBER (24 hr): (800)424-9300 or (703)527-3887
International Collect Calls Accepted
ACCIDENTAL RELEASE MEASURES:
Stop the source of the leak or release. Clean up releases as soon as possible. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.

Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

This material does not contain any CERCLA Hazardous Substances.

This material does not contain any SARA Title III Section 302 - Extremely Hazardous Substances.

This material does not contain any SARA Title III Section 313 - Toxic Chemicals.

7. HANDLING AND STORAGE

DO NOT USE IN HIGH PRESSURE SYSTEMS in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed. Do not use pressure to empty drum or drum may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner, or properly disposed of.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS
Use in a well-ventilated area. If user operations generate an oil mist, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT
EYE/FACE PROTECTION:
No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
SKIN PROTECTION:
No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances. Suggested materials for protective gloves include: <Viton> <Nitrile> <Silver Shield> <4H>
RESPIRATORY PROTECTION:
No special respiratory protection is normally required. If user operations generate an oil mist, determine if airborne concentrations are below the recommended exposure limits. If not, select a NIOSH/MSHA approved respirator that provides adequate protection from concentrations of this material. Use the following elements for air-purifying respirators: particulate.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION:
Pale yellow liquid.

pH:	NDA
VAPOR PRESSURE:	NA
VAPOR DENSITY (AIR=1):	NA
BOILING POINT:	NA
FREEZING POINT:	NDA
MELTING POINT:	NA
SOLUBILITY:	Soluble in hydrocarbon solvents; insoluble in water.
SPECIFIC GRAVITY:	0.86 - 0.88 @ 15.6/15.6C
EVAPORATION RATE:	NA
VISCOSITY:	32.0 - 61.2 cSt @ 40C
PERCENT VOLATILE (VOL):	NA

10. STABILITY AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
No data available.
CHEMICAL STABILITY:
Stable.
CONDITIONS TO AVOID:
No Data Available.
INCOMPATIBILITY WITH OTHER MATERIALS:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS:
* The mean 24-hour Draize eye irritation score in rabbits is 2/110.
SKIN EFFECTS:
For a 4-hour exposure, the Primary Irritation Index (PII) in rabbits is: 0.7/8. The acute dermal LD50 in female rabbits is >2.0 g/kg.
ACUTE ORAL EFFECTS:
The acute oral LD50 in female rats is >5 g/l.
ACUTE INHALATION EFFECTS:
Based on animal data for similar materials, the inhalation LD50 (4-hour) is expected to be greater than 5 mg/l.
ADDITIONAL TOXICOLOGY INFORMATION:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

12. ECOLOGICAL INFORMATION

ECOTOXICITY:
The 96-hour LC50 for rainbow trout (Oncorhynchus mykiss) is >5000 mg/l WAF. The 96-hour LC50 for mysid shrimp (Mysidopsis bahia) is >5000 mg/l WAF.
ENVIRONMENTAL FATE:
This material is considered inherently biodegradable. Small accidental leaks or releases of this material are not expected to present an environmental problem. See Section 6 for Accidental Release Measures.

13. DISPOSAL CONSIDERATIONS

Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

14. TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT SHIPPING NAME: NOT DESIGNATED AS A HAZARDOUS MATERIAL BY THE FEDERAL DOT
DOT HAZARD CLASS: NOT APPLICABLE
DOT IDENTIFICATION NUMBER: NOT APPLICABLE
DOT PACKING GROUP: NOT APPLICABLE

15. REGULATORY INFORMATION

SARA 311 CATEGORIES:

1. Immediate (Acute) Health Effects: NO
2. Delayed (Chronic) Health Effects: NO
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01=SARA 313	11=NJ RTK	22=TSCA Sect 5(a)(2)
02=MASS RTK	12=CERCLA 302.4	23=TSCA Sect 6
03=NTP Carcinogen	13=MN RTK	24=TSCA Sect 12(b)
04=CA Prop 65-Carcin	14=ACGIH TWA	25=TSCA Sect 8(a)
05=CA Prop 65-Repro Tox	15=ACGIH STEL	26=TSCA Sect 8(d)
06=IARC Group 1	16=ACGIH Calc TLV	27=TSCA Sect 4(a)
07=IARC Group 2A	17=OSHA PEL	28=Canadian WHMIS
08=IARC Group 2B	18=DOT Marine Pollutant	29=OSHA CEILING
09=SARA 302/304	19=Chevron TWA	30=Chevron STEL
10=PA RTK	20=EPA Carcinogen	

The following components of this material are found on the regulatory lists indicated.

DISTILLATES, HYDROTREATED HEAVY PARAFFINIC
is found on lists: 14,15,17,

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows:
PETROLEUM OIL
WHMIS CLASSIFICATION:
This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

16. OTHER INFORMATION

NFPA RATINGS: Health 0; Flammability 1; Reactivity 0;
HMIS RATINGS: Health 0; Flammability 1; Reactivity 0;
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT:
This is a new Material Safety Data Sheet.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	TPQ - Threshold Planning Quantity
RQ - Reportable Quantity	PEL - Permissible Exposure Limit
C - Ceiling Limit	CAS - Chemical Abstract Service Number
A1-5 - Appendix A Categories	() - Change Has Been Proposed
NDA - No Data Available	NA - Not Applicable

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Toxicology and Health Risk Assessment Unit, CRTC, P.O. Box 4054, Richmond, CA 94804

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

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THIS IS THE LAST PAGE OF THIS MSDS

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FUEL TECH™
Technology for a renewed environment™

MATERIAL SAFETY DATA SHEET

PRODUCT
NOxOUT® SCR 3200

Emergency Telephone Number
CHEMTREC - 1.800.424.9300 (24 hours)

SECTION 1 - PRODUCT IDENTIFICATION

Trade Name: NOxOUT® SCR 3200
Description: An aqueous solution of an amide
NFPA 704M/HMIS Rating: 1/1 Health 0/0 Flammability 0/0 Reactivity 0 Other
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 - COMPOSITION / INGREDIENT INFORMATION

Our hazard evaluation of the ingredient(s) under OSHA's Hazard Communication Rule, 29 CFR 1910.1200 has found none of the ingredient(s) hazardous.

SECTION 3 - HAZARD IDENTIFICATION

EMERGENCY OVERVIEW:
Caution: May cause irritation to skin and eyes. Avoid contact with skin, eyes, and clothing. Avoid prolonged or repeated breathing of vapor. Use with adequate ventilation. Do not take internally. Empty containers may contain residual product. Do not reuse container unless properly reconditioned.
Primary Route(s) of Exposure: Eye, Skin, Inhalation
Eye Contact: Can cause mild, short-lasting irritation.
Skin Contact: May cause irritation with prolonged contact.
Inhalation: May cause irritation to the respiratory tract and lungs.
SYMPTOMS OF EXPOSURE:
A review of available data does not identify any symptoms from exposure not previously mentioned.
Aggravation of Existing Conditions: A review of available data does not identify any worsening of existing conditions.

SECTION 4 - FIRST AID INFORMATION

Eyes: Immediately flush with water for 15 minutes while holding eyelids open. Call a physician.
Skin: Wash thoroughly with soap and rinse with water. Call a physician.
Ingestion: Do not induce vomiting. Give water. Call a physician.
Inhalation: Remove to fresh air. Treat symptoms. Call a physician.
Note To Physician: Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.
Caution: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

SECTION 5 - FIRE FIGHTING

Flash Point: None
Extinguishing Media: This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use water to cool containers exposed to fire.
Unusual Fire and Explosion Hazard: May evolve CO, CO_2, NOx, ammonia, and cyanuric acid under fire conditions.

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SECTION 6 - ACCIDENTAL RELEASE MEASURES

In case of transportation accidents, call the following 24-hour telephone number 1.800.424.9300 (CHEMTREC).

SPILL CONTROL AND RECOVERY:

Small Liquid Spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 15.

Large Liquid Spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 15.

SECTION 7 - HANDLING AND STORAGE

Storage: Keep container closed when not in use.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory Protection: Respiratory protection not normally needed. If significant dusting occurs, wear a NIOSH approved or equivalent dust respirator.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a positive pressure, self-contained breathing apparatus is recommended.

Ventilation: General ventilation is recommended.

Protective Equipment: Use impermeable gloves and chemical splash goggles when attaching feeding equipment, doing maintenance or handling product. Examples of impermeable gloves available on the market are neoprene, nitrile, PVC, natural rubber, viton and butyl (compatibility studies have not been performed).

The availability of an eye wash fountain and safety shower is recommended.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Color:	Clear, colorless	
Form:	Liquid	
Density:	9.09 lbs/gal.	
Specific Gravity:	1.090 @ 68 Degrees F	ASTM D-1298
Ph NEAT:	9.0	ASTM E-70
Flash Point:	None	
Freeze Point:	12 Degrees F	ASTM D-1177

Note: These physical properties are typical values for this product.

SECTION 10 - STABILITY AND REACTIVITY

Incompatibility: Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes.

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Thermal Decomposition Products: In the event of combustion CO, CO_2, NOx, ammonia, and cyanuric acid may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

SECTION 11 - TOXICOLOGICAL INFORMATION

Toxicity Studies: No toxicity studies have been conducted on this product.

SECTION 12 - ECOLOGICAL INFORMATION

If released into the environment, see CERCLA in Section 15.

SECTION 13 - DISPOSAL CONSIDERATIONS

Disposal: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.
As a non-hazardous liquid waste, it should be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to an industrial waste landfill. A non-hazardous liquid waste can also be incinerated in accordance with local, state and federal regulations.

SECTION 14 - TRANSPORTATION INFORMATION

Proper shipping name/hazard class may vary by packaging, properties, and mode of transportation. Typical proper shipping names for this product are:
All Transportation Modes: Product is not regulated during transportation

SECTION 15 - REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA Hazard Communication Rule, 29 CFR 1910.1200:

Based on our hazard evaluation, none of the ingredients in this product are hazardous.

CERCLA/Superfund, 40 CFR 117, 302:

Notification of spills of this product is not required.

SARA/Superfund Amendments and Reauthorization Act of 1986 (Title III) - Sections 302, 311, 312 and 313:

Section 302 - Extremely Hazardous Substances (40 CFR 355):

This product does not contain ingredients listed in Appendix A and B as an Extremely Hazardous Substance.

Sections 311 and 312 - Material Safety Data Sheet Requirements (40 CFR 370):

Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.
Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

Section 313 - List of Toxic Chemicals (40 CFR 372):

This product does not contain ingredients on the List of Toxic Chemicals.

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Toxic Substances Control Act (TSCA):

The chemical ingredients in this product are on the 8(b) Inventory List (40 CFR 710).

Resource Conservation and Recovery Act (RCRA), 40 CFR 261 Subpart C & D:

Consult Section 13 for RCRA classification.

Federal Water Pollution Control Act, Clean Water Act, 40 CFR 401.15/ Formerly Sec. 307, 40 CFR 116/Formerly Sec. 311:

None of the ingredients are specifically listed.

Clean Air Act, Sec. 111 (40 CFR 60), Sec. 112 (40 CFR 61, 1990 Amendments), Sec. 611 (40 CFR 82, Class I and II Ozone Depleting Substances):

This product contains the following ingredients covered by the Clean Air Act:
Urea - Section 111

STATE REGULATIONS:

California Proposition 65:

This product does not contain any chemicals which require warning under California Proposition 65.

Michigan Critical Materials:

This product does not contain ingredients listed on the Michigan Critical Materials Register.

State Right To Know Laws:

This product does not contain ingredients listed by State Right To Know Laws.

INTERNATIONAL REGULATIONS:

This is not a WHMIS controlled product under The House of Commons of Canada Bill C-70.

SECTION 16 - RISK CHARACTERIZATION

Our Risk Characterization is being determined.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

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SECTION 17 - REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (CD-ROM version), Micromedex, Inc., Englewood, CO.

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IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (CD-ROM version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, Ohio (CD-ROM version), Micromedex, Inc., Englewood, CO.

Shepard's Catalog of Teratogenic Agents (CD-ROM version), Micromedex, Inc., Englewood, CO.

Suspect Chemicals Sourcebook (a guide to industrial chemicals covered under major regulatory and advisory programs), Roytech Publications (a Division of Ariel Corporation), Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, Washington (CD-ROM version), Micromedex, Inc., Englewood, CO.

REVISED: 02/01/01

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Appendix C - Wild Goose Gas Storage Project Case Study

The following tables represent actual analysis results for discharges from Project vaults and containment structure sampling locations for the last three years of operations – years 2003, 2004 and 2005, as reported in the Annual Monitoring Reports. The Injection Well Skid Containment was installed in 2006 so results for Sampling Location SL-17 at the Remote Facility Site (Figure 3A) will be included in the 2006 annual report.

The following values represent the typical types of discharges that occur from the Project's vaults and containment structures, and were performed after the implementation of the Pollution Prevention Practices outlined in the Pollution Prevention Plan applicable to the discharges. The summary includes analysis results for five required constituents:

- pH
- Total Suspended Solids.
- Oil and Grease
- Total Petroleum Hydrocarbons as Gasoline
- Total Petroleum Hydrocarbons as Diesel

Grab samples were collected once each year at the point of discharge for each permitted site during one of the discharge events. The SL numbers on the summary tables refer to the discharge locations shown on the Facility Drawings in Appendix A. SL-4 and SL-5 were added as part of the Project expansion and were not operational until the 2004 calendar year, so that cell on the table is annotated with 'N/A'.

Note that the analysis for TPH Gasoline and Diesel indicated occasional results greater than the 50 µg/l. Gasoline and diesel are not used on or around these discharge sites. North Coast Labs indicated in its Case Narrative that these samples contain material within the molecular range of gasoline or diesel, but the material does not exhibit the peak pattern typical of either constituent. Also, three discharges during this period – at SL-1 and SL-16 in 2003 and at SL-7 in 2005 – had pH values either less than 6.5 or greater than 9.0. The reason for these exceedances is unknown and considered statistical anomalies.

Parameter: pH

	Sample Location	2003	2004	2005	Range
Remote Facility Site	SL-1 Produced Water Containment	9.6	7.6	9.0	7.6/9.6
	SL-2 Glycol Regenerator Containment	7.8	7.3	7.6	7.3/7.9
	SL-3 Methanol Containment	8.2	8.7	8.3	8.2/8.7
	SL-4 Building Drain Tank Containment	N/A	8.2	9.0	8.2/9.0
	SL-5 Urea Storage Tank Containment	N/A	8.2	8.4	8.2/8.4
Well Pad Site	SL-6 Well 18V Vault	7.9	7.2	7.6	7.2/7.9
	SL-7 Well 14V Vault	8.1	7.6	4.9	4.9/8.1
	SL-8 Well 16H Vault	7.5	7.1	7.4	7.1/7.6
	SL-9 Well 15H Vault	7.8	7.2	7.5	7.2/7.8
	SL-10 Well 17H Vault	7.7	7.1	7.5	7.1/8.0
	SL-11 Well 19H Vault	7.4	6.9	7.6	6.9/7.6
	SL-12 Well 20H Vault	7.4	7.1	7.5	7.1/7.5
	SL-13 Well 21H Vault	8.2	8.5	8.9	8.2/8.9
	SL-14 Well 22H Vault	7.2	7.4	7.6	7.2/7.6
	SL-15 Well 23H Vault	7.2	7.3	7.6	7.2/7.6
	SL-16 Well 24H Vault	9.7	9.4	8.9	8.9/9.7

Parameter: Total Suspended Solids [TSS]

Units: mg/l

	Sample Location	2003	2004	2005	Maximum
Remote Facility Site	SL-1 Produced Water Containment	4.2	7.6	1.7	8.5
	SL-2 Glycol Regenerator Containment	11.0	3.6	6.9	13.0
	SL-3 Methanol Containment	3.3	3.1	2.6	3.3
	SL-4 Building Drain Tank Containment	N/A	3.7	3.5	3.7
	SL-5 Urea Storage Tank Containment	N/A	<1.0	1.1	1.1
Well Pad Site	SL-6 Well 18V Vault	13.0	2.7	9.7	40.0
	SL-7 Well 14V Vault	15.0	9.2	37	37
	SL-8 Well 16H Vault	20.0	3.1	3.4	20.0
	SL-9 Well 15H Vault	9.0	1.3	3.0	20.0
	SL-10 Well 17H Vault	8.8	2.0	2.9	17.0
	SL-11 Well 19H Vault	2.8	3.3	5.4	5.4
	SL-12 Well 20H Vault	3.2	4.9	6.1	6.1
	SL-13 Well 21H Vault	2.0	7.6	3.7	7.6
	SL-14 Well 22H Vault	1.5	2.2	2.4	2.4
	SL-15 Well 23H Vault	2.0	3.7	2.4	3.7
	SL-16 Well 24H Vault	<1.0	4.3	1.3	4.3

Parameter: Oil & Grease

Units: mg/l

	Sample Location	2003	2004	2005	Maximum
Remote Facility Site	SL-1 Produced Water	4.1	2.3	<1.0	4.1
	SL-2 Glycol Regenerator	<1.0	<1.0	1.1	1.1
	SL-3 Methanol Containment	<1.0	2.4	1.0	2.4
	SL-4 Building Drain Tank Containment	N/A	<1.0	<1.0	<1.0
	SL-5 Urea Storage Tank Containment	N/A	<1.0	1.1	1.1
Well Pad Site	SL-6 Well 18V Vault	<1.0	1.2	<1.0	1.2
	SL-7 Well 14V Vault	1.1	1.3	1.6	1.6
	SL-8 Well 16H Vault	2.9	1.4	4.7	4.7
	SL-9 Well 15H Vault	1.4	1.0	1.7	1.7
	SL-10 Well 17H Vault	1.7	<1.0	<1.0	1.7
	SL-11 Well 19H Vault	1.9	1.2	1.4	1.9
	SL-12 Well 20H Vault	2.9	1.5	3.0	3.0
	SL-13 Well 21H Vault	<1.0	<1.0	<1.0	<1.0
	SL-14 Well 22H Vault	<1.0	<1.0	1.3	1.3
	SL-15 Well 23H Vault	2.1	<1.0	1.8	2.1
	SL-16 Well 24H Vault	1.2	1.1	<1.0	1.2

Parameter: TPHC – gasoline

Units: µg/l

	Sample Location	2003	2004	2005	Maximum
Remote Facility Site	SL-1 Produced Water Containment	ND	ND	140	140
	SL-2 Glycol Regenerator Containment	ND	ND	120	120
	SL-3 Methanol Containment	ND	ND	ND	ND
	SL-4 Building Drain Tank Containment	N/A	ND	ND	ND
	SL-5 Urea Storage Tank Containment	N/A	ND	ND	ND
Well Pad Site	SL-6 Well 18V Vault	ND	ND	ND	ND
	SL-7 Well 14V Vault	ND	ND	290	290
	SL-8 Well 16H Vault	ND	ND	ND	ND
	SL-9 Well 15H Vault	ND	ND	ND	ND
	SL-10 Well 17H Vault	ND	ND	ND	ND
	SL-11 Well 19H Vault	ND	ND	ND	ND
	SL-12 Well 20H Vault	ND	ND	ND	ND
	SL-13 Well 21H Vault	ND	ND	ND	ND
	SL-14 Well 22H Vault	ND	ND	ND	ND
	SL-15 Well 23H Vault	ND	ND	ND	ND
	SL-16 Well 24H Vault	ND	ND	ND	ND

Parameter: TPHC – diesel

Units: µg/l

	Sample Location	2003	2004	2005	Maximum
Remote Facility Site	SL-1 Produced Water Containment	ND	65	ND	65
	SL-2 Glycol Regenerator Containment	ND	ND	ND	ND
	SL-3 Methanol Containment	ND	ND	ND	ND
	SL-4 Building Drain Tank Containment	N/A	ND	ND	ND
	SL-5 Urea Storage Tank Containment	N/A	67	ND	67
Well Pad Site	SL-6 Well 18V Vault	ND	120	120	120
	SL-7 Well 14V Vault	ND	100	480	480
	SL-8 Well 16H Vault	82	69	100	100
	SL-9 Well 15H Vault	ND	70	ND	70
	SL-10 Well 17H Vault	ND	58	ND	58
	SL-11 Well 19H Vault	ND	74	59	74
	SL-12 Well 20H Vault	ND	74	470	470
	SL-13 Well 21H Vault	ND	55	ND	55
	SL-14 Well 22H Vault	ND	81	78	81
	SL-15 Well 23H Vault	ND	68	55	68
	SL-16 Well 24H Vault	ND	71	ND	71